

POLYAK, B.T. (Moskva.)

Gradient methods of maximization of functionals. Zhur. vych.
mat. i mat. fiz. 3 no.4:643-653 J1-Ag '63. (MIRA 16:7)

AUTHOR: Polyak, B. T. SOV/163-58 2-19/46

TITLE: Method of Determining the Reciprocal Independence of the Dimensions of Quantities (Metod opredeleniya vzaimnoy nezavisimosti razmernostey velichin)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1958, Nr 2, pp. 118 - 120 (USSR)

ABSTRACT: A method for a more accurate determination of the independence of one another of the dimensions of quantities is suggested. In a system with n -similar equations and m -unknown quantities $x_1, x_2, x_3, \dots, x_n$ the following cases may occur: $m > n$; in this case the system differs from 0, i.e. the unknown quantities $x_1, x_2, x_3, \dots, x_n$ are not equal to 0; $m = n$; the independent quantity is also not 0. $m < n$; in this case the fundamental formula is $R = m$. In transforming the equations with respect to the dimensions the author uses:

Card 1/2

Method of Determining the Reciprocal Independence of
the Dimensions of Quantities.

SOV/163 58-2-19/46

$$[g] = \frac{CM}{sek^2} ; [O] = Grad ; [C] = \frac{E}{CH^3} ;$$

$$[C] = \frac{k \Delta l}{E - Grad} ; [I] = CM.$$

There are 2 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: November 24, 1957

Card 2/2

POLYAK, B.T.

PLANE I BOOK EXTRACTATION SOV/134

Donetskaya po sovetskoye professory, 2th

Kristallograficheskaya metallurgiya i teoriya kristallov (Crystallization of Metals: Transactions of the Fourth Conference on the Theory of Casting Processes)

Moscow, 1960. M. SSSR, 1960. 235 p., 3,200 copies printed.

Academy of Sciences, USSR. Institute of Metallurgy, Leningrad. Kristallograficheskaya metallurgiya i teoriya kristallov.

Prof. E. I. B. B. Olyuyev, Doctor of Technical Sciences, Professor E. I. of

Polishing House Y. S. Rukhovich, Tech. Ed.: D. G. Tikhonova.

REMARK: This book is intended for metallurgists and scientific workers. It may also be useful to technical personnel at foundries.

CONTENTS: The book contains the transactions of the Fourth Conference (1960) on the Theory of Casting Processes. (The previous 3 conferences dealt with the topics of Casting Processes (1957), Solidification of Metals (1958), and the Mechanisms of Molten Metals (1959)). Questions of casting in the crystallization processes in castings (1957), questions of constructional metals, limitations of metals, including the crystallization of constructional metals,

alloy steels with special properties, cast iron, and of nonferrous alloys, are discussed. Emphasis is given to D. E. Chernov and N. Z. Gaidarov and their associates. B. B. Olyuyev and A. G. Sposylov for their contributions to the understanding of the basic problems involved in the theory of crystallization of ferrous and nonferrous metals and alloys. Academician A. V. Shubnikov is also mentioned in connection with his work on the planning of research on crystal formation. References accompany several of the articles.

Metallurgy, O. M. A. B. Olyuyev and B. B. Olyuyev. Influence of Alloy Composition on Conditions of the Primary Crystallization of Cast-
ing 49

Donetskaya, D. B. E. P. Rukhovich, and Y. S. Rukhovich. Investi-
gation of the Crystallization of Iron and its Alloys. 51

Olyuyev, B. G. On the Interrelation Between Solidification and
Crystallization Processes 62

Bull, E. V. Crystallization of Binary Alloys Subjected to Deep
Supercooling 69

Olyuyev, D. E. Influence of Insoluble Additives on the
Crystallization and Structure of Metals 76

Bayraktar, Y. Ya. Influence of the Solidifying Agent on the Direction of
Crystallization and Rate of Crystallization of an Ingot 86

Martov, A. M. On the Mechanism of the Crystallization and Recrystal-
lization Processes 94

II. CRYSTALLIZATION OF CONSTRUCTIONAL STEEL

Donetskaya, D. B. E. P. Rukhovich, and Y. S. Rukhovich. Investi-
gation of the Crystallization of Iron and its Alloys. 100

Donetskaya, D. B. E. P. Rukhovich, and Y. S. Rukhovich. Investi-
gation of the Crystallization of Iron and its Alloys. 106

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gation of the Crystallization of Iron and its Alloys. 112

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gation of the Crystallization of Iron and its Alloys. 121

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gation of the Crystallization of Iron and its Alloys. 126

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gation of the Crystallization of Iron and its Alloys. 134

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gation of the Crystallization of Iron and its Alloys. 139

Donetskaya, D. B. E. P. Rukhovich, and Y. S. Rukhovich. Investi-
gation of the Crystallization of Iron and its Alloys. 150

IVANTSOV, G.P.; LYUBOV, B.Ya.; POLYAK, B.T.; ROYTEURD, A.L.

Calculation of the crystallization of a metallic ingot with various
types of heat flow through its surface. Inzh.-fiz. zhur. no.3:41-
47 Mr '60. (MIRA 13:10)

1. Institut chernoy metallurgii, Moskva.
(Crystallization)

18.7520

27753
S/058/61/000/007/048/086
A001/A101

AUTHORS: Ivantsov, G.P., Polyak, B.T.

TITLE: Problems of stability of crystal regular shape

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 229, abstract 7E60 ("Sb. tr. Tsentr. n.-i. in-ta chernoy metallurgii, 1960, no. 21, 464-479)

TEXT: The authors derive a growth law for crystals of spherical shape of pure substances from a supercooled smelt. The possibility, in principle, is shown of dendritic crystallization in the single-component system. The regular shape of crystals becomes unstable also for an isotropic substance, i.e., the cause of origination of dendrites consists in crystallization conditions rather than in the crystalline structure of the substance. There exists a "radius of stability" depending on supercooling. A regular shape will be stable for crystals of lesser size, and unstable for larger size. The concept of "critical supercooling" (i.e. such supercooling that dendritic crystallization is impossible for all lesser supercoolings) does not correspond to reality. The matter is just that radius of stability is large for low supercooling. 4
[Abstracter's note: Complete translation]

Card 1/1

POLYAK, B.T.

Problems of multiple course selection. Vop. teor. mat. mash.
no.2:156-173 '62. (MIRA 15:8)
(Electronic calculating machines) (Games, Theory of)

POLYAK, B.T.; SHREYDER, Yu.A.

Use of Walsh polynomials in approximate calculations. Vop. teor.
mat. mash. no.2:174-190 '62. (MIRA 15:3)
(Polynomials) (Approximate computation)

VASHCHENKO, K.I., otv.red.; ARTAMONOV, A.Ya.,red.; ZASLAVSKIY, S.Sh.,red.;
POLYAK, B.V.,red.; SERDYUK, V.K., inzh., red.; RUDENSKIY, Ya.V.,
tekhn.red.

[Progressive founding technology] Peredovaya tekhnologiya
liteinogo proizvodstva. Kiev, Gos. nauchno-tekhn.izd-vo
mashinostroil lit-ry, 1958. 152 p. (MIRA 12:1)

1. Nauchno-tekhnicheskoye obshchestvo mashinostroitel'noy
promyshlennosti.

(Founding)

ИВАНОВ, В. В.

Electric welding of flat steel objects. Kiev, Vyscha Shkola nauk, 1935. 19 p.

POLYAK, Bela, dr.

Ulcerative colitis as a precancerous state. Orv. hetil. 105
no.38:1794-1795 20 S'64

1. Fov. Uzsoki itcai Korhaz, II. Sebészeti Osztaly.

POLYAK, D.

Electric automobiles. Za rul. no.4:14-15 Ap '57. (MIRA 10:6)

1. Starshiy inzhener laboratorii elektreagratov Nauchno-issledovatel'skogo avtomobil'nogo instituta.
(Automobiles, Electric)

GRATSIANOV, Yu.A., kand.tekhn.nauk; POLYAK, D.G., kand.tekhn.nauk;
PUTIMTSEV, B.N., inzh.; TATUR, O.N., inzh.

Manufacture and characteristics of ferromagnetic powders
for electromagnetic powder clutches and brakes. Elektrotehnika
36 no.11:42-47 N 1965. (MIRA 18:11)

POLYAK, D. G.

Cand Tech Sci - (diss) "Study of traction conditions and of technico-economic indices of batteries of motor vehicles (electromobiles)." Moscow, 1961. 19 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Moscow Order of Lenin and Order of Labor Red Banner Higher Technical College imeni N. E. Bauman); 200 copies; price not given; (KL, 7-61 sup, 243)

POLYAK, D.G.

POLYAK, D.G.

Technical and economical indicators and ranges for efficient
use of electric automobiles. Avt.i trakt.prom. no.8:5-8 Ag '57.
(MIRA 10:12)

1. Gosudarstvennyy soyuznyy ordena Trudovogo Krasnogo Znameni
nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut.
(Automobiles, Electric)

POLYAK, D.G.

Concerning two problems on the reliability theory of radio
electronic equipment. Radiotekhnika 15 no.10:6C-64 O '60.
(MIRA 14:9)

(Electronic apparatus and appliances)
(Electronic industries--Quality control)

83913
S/108/60/015/010/006/008
B012/B060

13,2929

AUTHOR: Polyak, D. G.

TITLE: Two Problems From the Theory of the Reliability²⁵ of a Radioelectronic System

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 10, pp. 60-64

TEXT: Parallel reserve elements are introduced to augment the reliability of radioelectronic devices. These elements are switched²⁵ on automatically whenever the main elements break down. In consideration of the higher costs involved, the author studied the problem of the maximum increase in reliability at lowest costs. A paper by B. R. Levin (Ref. 1) is referred to. The latter had proposed two tasks: (1) to choose the number of elements in such a way as to allow reliability to be increased to a given quantity at the lowest possible costs; (2) to choose the number of elements in such a way as to ensure the highest possible reliability at given costs. The two tasks were solved in Refs. 2 and 3, but no general solution was found. An explicit formula is given for the number k_j of elements, where $j = 1, n$, for the second task, and a method is offered

Card 1/2

83913

Two Problems From the Theory of the
Reliability of a Radioelectronic System

S/108/60/015/010/006/008
B012/B060

for determining k , in the first task. The main difficulty involved in this method is the solution of an algebraic equation of n -th degree. The approximate formula obtained for a system of high reliability fits the formula obtained in Ref. 2 and indicated in Ref. 1. There are 3 references, 1 of which is Soviet.

SUBMITTED: February 8, 1960

X

Card 2/2

L 20941-66 EWP(e)/EWT(m)/EWP(t)/EWP(k) JD

ACC NR: AP6002605

(A)

SOURCE CODE: UR/0286/65/000/023/0104/0104

AUTHORS: Polyak, D. G.; Yegorov, Yu. I.; Shereshev, N. A.

28
B

ORG: none

TITLE: A device for the automatic control of an electromagnetic powder clutch of an automobile. Class 63, No. 149311

14 17

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 23, 1965, 104

TOPIC TAGS: electromagnetic device, clutch, automatic control equipment

ABSTRACT: This Author Certificate presents a device for the automatic control of an automobile electromagnetic powder clutch. The device, including a relay and a resistor, simplifies the mechanism construction. The relay has three windings. One of the relay windings is connected to the generator armature, the second to the shunt winding of the generator, and the third to the winding of the armature which automatically disengages the supplementary resistance of the winding circuit of the clutch when the motor reaches a specified rpm.

SUB CODE: 13/ SUBM DATE: 05May60

Card 1/1 FW

POLYAK, D.G.

Probability of operational reliability of pulse counters.
Radiotekhnika 17 no.10:52-53 0 '62. (MIRA 15:9)

(Pulse techniques (Electronics))
(Counting devices)

YESENOVSKIY-LASHKOV, Yuriy Konstantinovich, inzh.; POLYAK, David
Grigor'yevich, kand. tekhn.nauk; LAPIDUS, V.I., red.;
BODANOVA, L.P., tekhn. red.

[Automatic control of motor vehicles] Avtomatizatsiya
upravleniya avtomobilem. Moskva, Avtotransizdat, 1963. 112 p.
(MIRA 16:8)
(Motor vehicles) (Automatic control)

L 23817-66 EWP(t)/EWT(n)/EWP(t)/EWP(k)/EWA(h) IJP(c) JD

ACC NR: AP6015278

SOURCE CODE: UR/0292/65/000/011/0042/0047

AUTHOR: Gratsianov, Yu. A. (Candidate of technical sciences); Polyak, D. G. (Candidate of technical sciences); Putimtsev, B. N. (Engineer); Tatur, O. N. (Engineer)

ORG: none

TITLE: Production and characteristics of ferromagnetic powders for magnetic fluid clutches and brakes

SOURCE: Elektrotehnika, no. 11, 1965, 42-47

TOPIC TAGS: ferromagnetic material, iron, iron alloy, molten metal, induction furnace, annealing, magnetic permeability, clutch

ABSTRACT: A method is developed for producing ferromagnetic powders of iron and iron alloys for use in magnetic fluid clutches and brakes. The metal is melted in an induction furnace and a stream of the molten metal is vaporized in a gas jet with a ring nozzle using compressed nitrogen. Studies show that the stream of liquid metal must be intensely dispersed by a strong jet of inert gas to produce fine particles with the proper density. The resultant powders are subjected to reduction annealing at 650-700° for four hours to produce the necessary magnetic properties. This method produces spherical particles of high density which are free from defects detrimental to the magnetic properties of the powders. These ferromagnetic powders show high permeability in strong magnetic fields. Tests with magnetic fluid clutches showed that the powders are highly stable with respect to operating characteristics. Orig. art. has: 8 figures, 1 formula, and 3 tables. [JPRS]

SUB CODE: 13, 20 / SUM DATE: none

UDC: 621.3.042.15.001.5

POLYAK, D. G.

Automobiles - Electric Equipment

Testing the operation of the electrical equipment of an automobile. Scientific Research Institute of Automobile Instruments. Reviewed by D. G. Polyak. Avt. trakt. prom. No. 2, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

POLYAK, D.I.

Using the GS-1 hydraulic copying rest. Stan.1 instr. 31
no.2:41-43 F '60. (MIRA 13:5)
(Lathes--Attachments)

POLYAK, D.I.

Cutting spiral loop-shaped grooves in bushings on turret lathes. Stan.1
instr. 30 no.3:33-34 Mr '59. (MIRA 12:3)
(Metal cutting)

Polyak D.I.

0000

1911. EXPERIENCE ON CONNECTION OF TRANSFORMERS WITHOUT DRYING. D.I. Polyak. 021.314.2.048

EL 2
 Elektricheskoye, 1955, No. 5, 25-27. in Russian.
 Some additional suggestions beyond the transformer makers' recommendations are made, namely, that, since $\tan \delta$ varies from the dry to the humid state by factors of 10 to 30, whereas only increase by a factor of 1.5 is permissible, it is quite possible that the moisture content of the insulation is not excessive when $\tan \delta$ is larger than permissible. A revision of the factor 1.5 is thus required. At any rate, if this is not greater than permitted, it is quite safe to connect the transformer without drying, even if other requirements are not quite satisfied. If the oil is unsatisfactory, it must be purified. The $\tan \delta$ test may be replaced by a capacitance-frequency test.
 B.F. Kraus

POLYAK, D.I., inzhener

Putting transformers into service without drying. Elektrichestvo
no.9:63-64 S'55. (MIRA 8'11)

1. Elektromontazhnyy trest Sibirskogo rayona.
(Electric transformers)

POLYAK, D.I.

AID P - 3257

Subject : USSR/Electricity

Card 1/2 Pub. 27 - 12/25

Author : Polyak, D. I., Eng.

Title : An experiment in putting a transformer into service without preliminary drying out

Periodical : Elektrichestvo, 9, 63-64, S 1955

Abstract : The author discusses the methods recommended by circular 3/E of the Ministry of Electric Power Stations for putting power transformers into service at the place of assembly without preliminary drying out and heating. He presents data from his own experience with transformers of 10,000 kva and higher capacity assembled since 1942. Between 1946 and 1952, he supervised the introducing into operation of transformers with 691,000 kva of total capacity without preliminary drying out and some without pre-heating. This total made up 97% of all transformer capacity put into service in that period at that particular power system. The author describes the testing methods and discusses some of the

POLYAK, E.A.

Certain problems in the theory of titration. Report No.1: Titration curves and the possibility of titrimetric determinations. Zhur.anal. khim. 18 no.6:687-697 Je '63. (MIRA 16:9)

1. Sverdlovsk Plant of Chemical Reagents.

POLYAK, E.A.

Certain problems of the theory of titration. Report No.2:
Factors interfering in titrations in diluted solutions.
Zhur.anal.khim. 18 no.7:787-795 J1 1963. (MIRA 16:11)

1. Sverdlovsk Plant of Chemical Reagents.

BUZAYEVA, A.I.; POLYAK, E.A.; PERKINA, A.S.; KOMANTSEVA, M.I.

Use of complexometric methods for determining the basic substance
in chemical reagents. Prom. khim. reak. i osobo chist.
veshch. no.1:22-24 '63. (MIRA 17:2)

S/032/63/029/002/007/028
B101/B186

AUTHORS: Polyak, E. A., and Perkina, L. S.

TITLE: Determination of impurities in vanadium pentoxide

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 2, 1963, 161-162

TEXT: (1) Copper and cadmium were determined in vanadium pentoxide by twice precipitating the hydroxides in alkaline medium after adding 2 mg Fe as collector, dissolving the precipitate in hot HCl, and using polarography in the presence of NH_4OH excess. 0.001% Cu and Cd can be determined, the relative error being $\leq 10\%$. (2) Lead was analyzed polarographically without preliminary elimination of V(V), a 10% NaOH solution serving as background. The half-wave cycle of Pb is -0.80 v with respect to the saturated calomel electrode whereas the reduction of V(V) begins only at a much more negative potential. The disturbing effect of Cr(VI) is eliminated by adding NaF. (3) Fe is colorimetrically determined by the sulfosalicylate complex. Fe(III) is separated from V(V) in alkaline solution, $\text{Cd}(\text{OH})_2$ serving as collector. $1 \cdot 10^{-4}\%$ Fe can be determined.

Card 1/2

Determination of impurities in ...

S/032/63/029/002/007/028
B101/B186

(4) Zinc is determined by colorimetrically measuring its dithizon complex at pH 9-11. $2 \cdot 10^{-4}\%$ Zn can be determined.

ASSOCIATION: Sverdlovskiy zavod khimicheskikh reaktivov
(Sverdlovsk Plant of Chemical Reagents)

Card 2/2

POLYAK, E.A.; PERKINA, L.S.

Determination of impurities in vanadium pentoxide. Zav.lab. 29 no.2:
161-162 '63. (MIRA 16:5)

1. Sverdlovskiy zavod khimicheskikh reaktivov.
(Vanadium oxides) (Metals—Analysis)

POLYAK, E.A.; STREL'NIKOVA, N.P.; PAVLOVA, V.N.; RIVNYY, V.S.; ONUFRIYENOK,
I.P.; SOKOLOVICH, V.B.; LEKHOVITSKIY, I.N.; ALEKSANDROVA, Ye.N.;
CHERNUKHA, G.N.

Brief reports. Zav.lab. 25 no.2:162-163 ' 59. (MIRA 12:3)

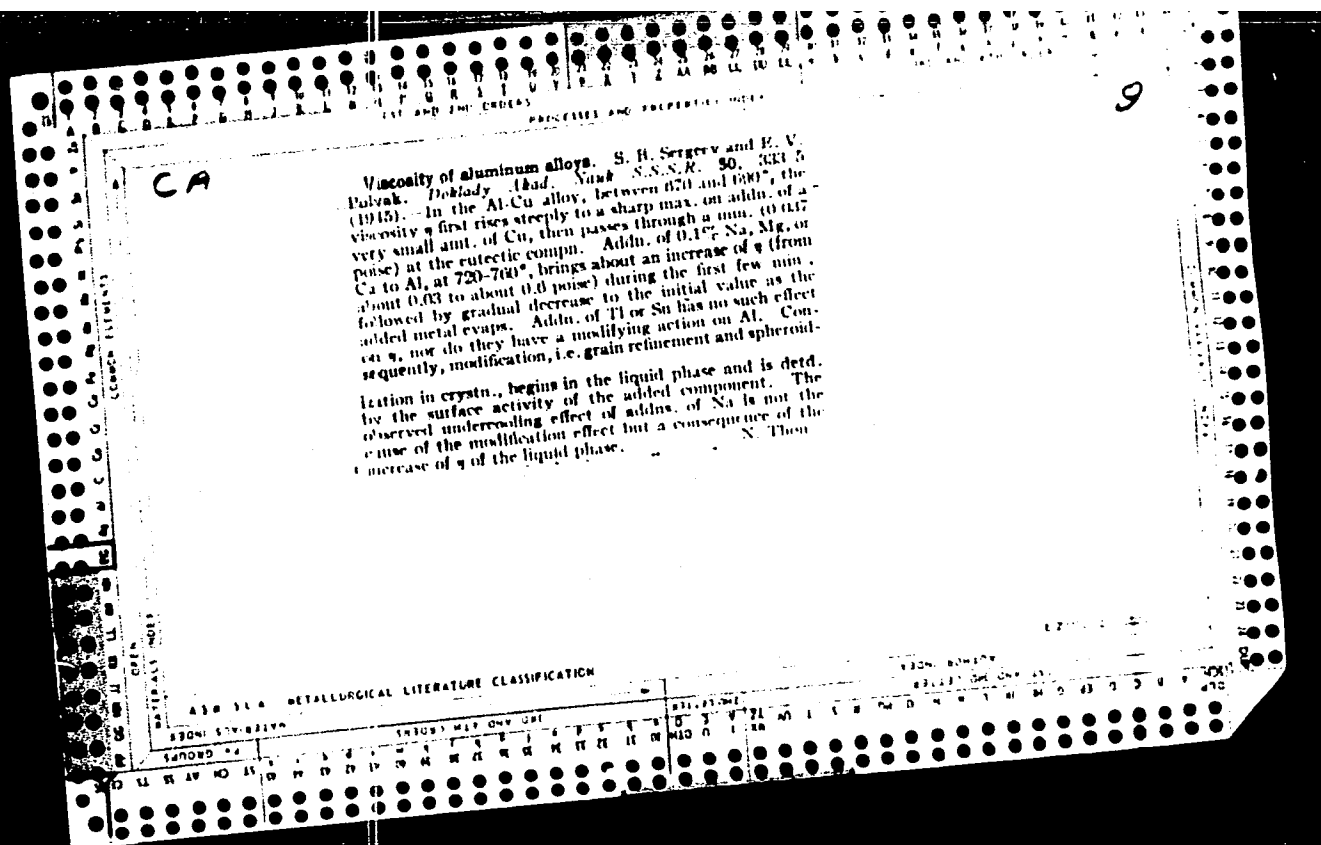
1. Sverdlovskiy zavod khimicheskikh reaktivov (for Polyak).
 2. Noril'skiy gorno-metallurgicheskiy kombinat (for Strel'nikova, Pavlova).
 3. Slavyanskiy sodovyy kombinat (for Rivnyy).
 4. Tomskiy politekhnicheskii institut (for Onufriyenok, Sokolovich).
 5. Khar'kovskiy elektrotekhnicheskii zavod (for Lekhovitskiy, Aleksandrova).
 6. Moskovskiy mashinostroitel'nyy zavod (for Chernukha).
- (Chemistry, Analytical)

PROCESS AND PROPERTIES INDEX	
ca	<p>Determination of the viscosity of molten aluminum and its alloys. E. V. Polyak and S. V. Sergeev. <i>Compt. rend. acad. sci. U. R. S. S.</i> 30, 137-9 (1941) (in English). - The viscosities of molten Al and silumin (Si-Al alloy contg. Si 12.5, Fe 0.44 and Mg 0.01%) were detd. by application of Ferschaffelt's formulas to data obtained for damping of the oscillations of a steel ball in the molten metal or alloy covered by a layer of carnallite. Values obtained for viscosity (in poises) were: Al, 800°, 0.01392; 0.01445; 705°, 0.01850, 0.01880; 730°, 0.02114, 0.02096; 720°, 0.02110; 700°, 0.02890; 690°, 0.03733; 670°, 0.04150, 0.04561; silumin, 775°, 0.01061; 770°, 0.01323; 740°, 0.02161, 0.02073; 720°, 0.02617, 0.02450; 700°, 0.02551, 0.02342; 690°, 0.03089; 650°, 0.04036, 0.0360; 640°, 0.04368; 630°, 0.04494; 620°, 0.04844, 0.05085. The capillary efflux method was unsuccessful for the detn of viscosity of silumin owing to clogging of the capillary with Al_2O_3. G. W. Ayers.</p>
<p>ASME 10.1 - METALLURGICAL LITERATURE CLASSIFICATION</p>	

The Viscosity of Aluminium-Silicon Alloys. E. V. Polyak and S. V. Serget (Compt. rend (Doklady) Acad. Sci. U.R.S.S., 1941, 33, 237-245). [In German.] The viscosity of aluminium-silicon alloys within the range of 0.25-18% Si were determined by the oscillating-ball method (see *Met. Abs.*, 1941, 8, 129), somewhat modified for the present investigations. Data on the viscosity in relation to composition are tabulated, for temperatures of 50 and 120° C. above the liquidus temperature. The viscosity of alloys in the solid-solution range is several times that of pure aluminium; with increase of silicon, the viscosity decreases until a minimum is reached at the eutectic. Some of the values reported for the viscosity coeff. (in poises) are as follows: (1) Superheated by 120° C.: 0.15% Si 0.0237, 1.5% Si 0.0090, 6.1% Si 0.0729, 11.4% Si 0.0484, 16.8% Si 0.0099. (2) Superheated by 50° C.: 0.15% Si 0.0361, 1.50% Si 0.1090, 10.6% Si 0.0749, 11.4% Si 0.0625, 19.0% Si 0.0920. A general relationship between the constitutional diagram and the dependence of the viscosity on concentration has not yet been found. Additions of 0.05, 0.1, and 0.2% of metallic sodium and 3% of a 2:1 mixture of NaF and NaCl at 700°-800° C. increase the viscosity coeff. of the silicon considerably (5-7 minutes after addition about 15 times, 40 minutes after only about twice the viscosity of the original silicon). Some mean values for the modified silicon at 700°-720° C. are tabulated at head of following page. Additions of sodium have a similar effect on the viscosity of commercial aluminium (99.5% purity). Addition of sodium leads to a finer grain structure and improves the mechanical properties, but, on the other hand, it increases

Na, %.	Viscosity Coeff. (poises) after	
	7 minutes.	40 minutes.
0	0.048	0.048
0.05	0.64	0.115
0.1	0.76	0.122
0.2	0.73	0.15

also the porosity of the castings, owing to the greater gas content (hydrogen) of the alloy, and to the slower escape of the gas bubbles through the more viscous liquid alloy.—E. A.



Determination of the viscosity of molten alloys and its applications. S. V. Sergeev and E. V. Fedyak. *Zavodskaya Lab.* 13, 336-441 (1947).—Abs. viscosities η were determined from the photographically recorded logarithmic decrements of torsional oscillations of a steel sphere (20-25 mm.) suspended on a 50-60 cm. steel wire 0.20-0.25 mm. in diam., calibrating the app. with H_2O and $CaCl_2$ and calcg. η by the formulas of Verschoffel (*C.A.* 10, 694). (1) In pure Al, η increases sharply with the falling temp. nearing the freezing temp.; $\log \eta$ in terms of $1/T$ is linear over a wide temp. interval but deviates from linearity close to freezing; this indicates beginning structure formation in the liquid state at the precryst. stage. (2) The binary system Al-Si (up to the melting temp.) shows, besides the min. of η at the eutectic compn. an initial increase with increasing Si up to a sharp

[illegible]

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***Determination of the Viscosity of Alloys of the System
Tin-Bismuth.** E. V. Polyak and S. V. Sergeev (*Doklady
Akad. Nauk S.S.S.R.*, 1947, 57, 677-690; *C. Abs.*, 1950, 44,
3304).—By the method previously described (*ibid.*, 1941,
10, 137; 52, 244; *M.A.*, 2, 129; 10, 201), the viscosity
curves for the system Sn-Bi were determined at 200°, 235°, 270°,
320°, 350°, and 400° C. At 200° and 235° C. clearly defined
viscosity max. were found in the neighbourhood of the eutectic.
These disappeared at 270° C. It is suggested that this
phenomenon is due to the development of a structure as,
e.g., crystal nuclei.

POLYAK, E.V.

POLYAK, E.V.; SERGEYEV, S.V.

Viscosity of melts in a high vacuum. Izv. Sek. fiz.-khim. anal. 22:83-
91 '53. (MLRA 7:5)

(Viscosity) (Alloys)

83238

S/129/60/000/009/001/009
E193/E483

174310 2308

AUTHORS: Kishkin, S.T., Member-Correspondent AS USSR and
Polyak, E.V., Candidate of Technical Sciences

TITLE: Kinetics of Rupture of Heat-Resistant Alloys in Creep²⁶

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov,
1960, No.9, pp.2-6 + 2 plates

TEXT: To elucidate the mechanism of rupture of Ni- and Cr-base alloys under prolonged load at high temperatures, creep tests were conducted in vacuum (10^{-5} mm Hg) on flat test pieces with one of the sides carefully polished so that the changes in the microstructure could be periodically observed with the aid of a low power ($\times 200$) microscope, without interrupting the tests. To supplement these studies, an electron microscope was used to examine the fine microstructure of the test pieces on the completion of the tests. The following conclusions were reached:
1) During the first 30 to 50% of the life of specimens, tested in creep, microcracks are formed at the grain boundaries which are normal to the direction of the applied stress. With increasing duration of creep, the number and the size of microcracks increase, leading ultimately to fracture of the specimen.
Card 1/2

83238

S/129/60/000/009/001/009

E193/E483

Kinetics of Rupture of Heat-Resistant Alloys in Creep

- 2) The alloys studied in the course of the present investigation (ZhS3, EI617) exhibited relatively high elongation (10 to 15%) when subjected to short-time high-temperature tests but failed by brittle fracture when tested in creep at the same temperature, the elongation under these conditions being only 1 to 3%. This difference is attributed to the fact that in the former case, fracture is preceded by plastic deformation within the grains, whereas in the latter case, fracture is brought about mainly by the formation of cracks at the grain boundaries, little evidence of deformation within the grains having been observed. ✓
- 3) In the case of the ZhS3 alloy, in the as-cast condition, the formation of cracks takes place later than in the material that has been subjected to preliminary mechanical treatment. This effect is attributed to the fact that the growth of cracks in the cast alloy is arrested by the carbide precipitates.
- 4) The formation of microcracks can be delayed and the life of the specimen increased if a thin surface layer is removed from the surface of the specimen by electrolytic polishing. There are 8 figures and 9 references: 8 Soviet and 1 English.

Card 2/2

POLYAK, E. V.

- Defektoskopiya metallov; sbornik statey (Flaw Detection in Metals; Collection of Articles) Moscow, OOOsvet, 1959. 150 p. Errata slip inserted. 4,350 copies printed.
- Md. D.S. Shreyber, Candidate of Technical Sciences; Ed.: M.S. Lagunovskiy; Trans. Ed.: V.P. Roshin; Managing Ed.: A.G. Zayonchikov, Engineer.
- PREFACE: This book is intended for engineers and technicians in the field of nondestructive inspection and testing of metals.
- CONTENTS: This collection of articles deals with methods of nondestructive inspection and testing of metals. Results of investigations conducted at scientific research institutes and plants of machine-building, x-ray, ultrasonic, and fluorescent-penetrant inspection methods are described. Detailed descriptions of nondestructive methods and equipment are presented. Data are given on the status of the development of nondestructive methods in some of the countries. No personalities are mentioned. References follow several of the articles.
1. A.A. Magarilov, V.I. Kuznetsov, and V.I. Kuznetsov. Nondestructive Inspection of Parts by Alternating Current and Inspection by the Magnetic-particle Method 17
2. D.S. Shreyber. Measuring Magnetic Fields on Parts of Intricate Shape and Inspection of Blades by the Magnetic-particle Method 55
3. A.G. Zayonchikov, P.S. Equipment for Inspecting Parts by the Magnetic-particle Method 62
4. S.M. Zayonchikov. Automatic Flaw Detector for Inspecting Mass-produced Steel Parts 76
5. S.M. Zayonchikov, S.M., and O.Th. Sila-Moritskiy. Electromagnetic Induction Method of Flaw Detection 80
6. S.M. Zayonchikov. Some Methods and Instruments for Nondestructive Inspection of the Thickness of Coatings on Parts 111
7. S.M. Zayonchikov, V.E. Practical Application of Electromagnetic Methods of Nondestructive Testing 117
8. S.M. Zayonchikov. Flaw Detection in Light-alloy Parts by the Electromagnetic Induction Method 126
9. A.G. Zayonchikov, P.A. High-frequency Induction Instrument for Detecting Cracks and Intergranular Corrosion 133
10. S.M. Zayonchikov. Fluorescent-penetrant Flaw-detection Method and the Experience Gained by Its Use in Machine Building 139
11. S.M. Zayonchikov. Magnetic and Fluorescent-penetrant Inspection of Parts in the Repair and Servicing of Aircraft Equipment 155
12. S.M. Zayonchikov. Characteristic Features of the Use of the Fluorescent-penetrant Method of Inspecting Parts 163
13. S.M. Zayonchikov, O.Th. Nondestructive Magnetic Methods for Measuring Thicknesses of Coatings 166
14. S.M. Zayonchikov, I.I. Electrical Thickness Gage for Measuring Anodized Coatings of Aluminum-alloy Parts 174
15. S.M. Zayonchikov, L.M. Thermoelectrical Method of Measuring Thicknesses of Electroplated Coatings 189
16. S.M. Zayonchikov, L.M. Thermoelectrical Method of Inspecting the Quality of Bonds in Metals 192
17. S.M. Zayonchikov, B.I. Use of Back-scattering Beta-radiation for Inspecting Thicknesses of Coatings 196
18. S.M. Zayonchikov, S.Y. New X-Ray Equipment and Image Recorders for X-Ray Flaw Detection 202
19. S.M. Zayonchikov, S.Y. X-Ray Tube With Rotating Anode 219
20. S.M. Zayonchikov, D.S. Ultrasonic Flaw Detection 241
21. S.M. Zayonchikov, and O.Y. Prokhorov. Equipment for Ultrasonic Inspection 256
22. S.M. Zayonchikov, and O.Y. Prokhorov. General Characteristics of the Pulse-Echo Type Ultrasonic Flaw-detection Method 267
23. S.M. Zayonchikov, A.A. Characteristic Features of the Pulse-Echo Type Ultrasonic Flaw-detection Method 268
24. S.M. Zayonchikov, M.E. Ultrasonic Flaw-detection in Forgings and Valuation of the Size of the Defects Revealed 269
25. S.M. Zayonchikov, and O.Y. Prokhorov. Automation of Ultrasonic Inspection 275
26. S.M. Zayonchikov, D.S., and I.I. Zayonchikov. Application of Ultrasonic Vibrations for Processing and Testing Materials 282

34547

S/659/61/007/000/036/044
D205/D303

18.1151

AUTHORS: Kishkin, S.T., and Polyak, E.V.

TITLE: Kinetics of the break of heat resisting alloys in the
creeping process

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Issledova-
niya po zharoprochnym splavam, v. 7, 1961, 295 - 308

TEXT: The heat resisting alloys used at high temperatures and stresses are disrupted mainly along the grain boundaries at very low plastic deformations and the whole process is considered to be slow. Microcracks are first formed which then develop until a break occurs. This work is concerned with the kinetics of the break of industrial, heat resisting Ni-Cr alloys taking into account external factors (temperature, time, stress) and internal factors (structure, state of grain boundaries and of the surface layer). The vacuum metallography method of investigation was applied which permits direct observation at high temperatures and stresses. Microphotographs taken at various time intervals describe the kinetics of break between

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Kinetics of the break of heat ...

S/659/61/007/000/036/044
D205/D303

700 - 900°C for stresses of up to 60 kg/mm². Development of the breaking process is discussed. After 30 - 50 % of the life time of the sample microcracks appear on the grain boundaries, directed normally to the tension stresses. In time the number and dimensions of the cracks grow, causing the material to break. Increased stress accelerates the process which proceeds in two stages: Gradual development of the cracks on the grain boundaries followed by a fast final break. No appreciable internal slip was observed in the grains of the Ni-Cr alloys at high temperatures and at usual working stresses. The break occurs by the development of the cracks at 1 - 3 % elongation, while at very high stresses (of the yield point order) the elongation reaches 10 - 15 % which is caused by very intensive internal slip. The surface damage on prolonged heating, connected with the oxidation and burning out of some of the alloying elements, accelerates the development of the cracks, lowering the durability of the material. Surface protection is, therefore, required to ensure longer working life. The coarse structural non-uniformity showing itself on the surface in liquation strips and oxide films causes premature crack developments and break. Removal of the dama-

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X

BOKSHEYN, S.Z. (Moskva); KISHKIN, S.T. (Moskva); LOZINSKIY, M.G. (Moskva);
SOKOLKOV, Ye.N. (Moskva); Primalni uchastnye: PODVOYSKAYA, O.N.;
ZILOVA, T.K.; SOROKINA, K.P.; POLYAK, E.V.; MOROZ, L.M.;
BULYGIN, I.P.; LASHKO, N.F.; POKHLESTOVA, T.N.; GORDEYEVA, T.A.;
YAGLOV, R.V.; VOLODINA, T.A.; KORABLEVA, G.N.; ANTIPOVA, Ye.I.

Thermomechanical treatment of chromium-nickel-manganese
austenitic steel. Izv. AN SSSR. Otd. tekhn. nauk. Met. i topl.
no.2:15-21 Mr-Ap '62. (MIRA 15:4)
(Chromium-nickel steel--Hardening)

L 1994-63

BDS

ACCESSION NR: AP3007823

S/0048/63/027/009/1184/1187 57

AUTHOR: Rozenfel'd, L.B.; Kushnir, Yu.M.; Zaytsev, P.V.; Titov, L.A.; Bezlepkin, S.V.; Polyak, E.V. 55

14
TITLE: Reflecting electron microscope adapted for examination of strained specimens /Report, Fourth All-Union Conference on Electron Microscopy held in Sumy 12-14 March 1963/

SOURCE: AN SSSR, Izv.Ser.fizicheskaya, v.27, no.9, 1963, 1184-1187

TOPIC TAGS: electron microscopy, strain, strength of material

ABSTRACT: The paper gives the results of testing a reflecting electron microscope²⁾ adapted for observation of strained specimens. A reflecting electron microscope described earlier (Radiotekhnika i elektronika, No.8, 1359, 1961 and Zavodskaya laboratoriya, 27, 1528, 1961) with a maximum tilt angle of 22° was modified for this purpose by provision of a special object holder and incorporation of a two-slit projector lens to provide better resolution over the entire field. The optimum shape for the specimens was found on the basis of extensive experimentation; this is shown in Figure 1 of the Enclosure. The specimen holder and straining de-

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L 19954-63

ACCESSION NR: AP3007823

2
vice is shown in Figure 2. The strain is applied by means of a synchronous electric motor rotating the screw shaft. The deformation process was recorded by internal photography and by photography (still and motion picture) of a glass screen mounted in the bottom of the internal camera and viewed by means of a mirror. A series of four micrographs of the surface of a specimen of heat-resisting alloy, lightly etched before straining, is reproduced. The electron micrographs reveal some details not disclosed by an optical microscope. "In conclusion, the authors express their gratitude to G.V.Der-Shvarts and V.P.Rachkov for calculation of the two-slit achromatic projector lens." Orig.art.has: 4 figures.

ASSOCIATION: none

SUBMITTED: 00

DATE ACQ: 07Oct63

ENCL: 01

SUB CODE: ML, SD

NO REF SOV: 002

OTHER: 000

Card2/2

L 11227-63

EWI(11)/EWT(m)/BDS--AFFTC/ASD--JD

ACCESSION NR: AP3000488

S/0129/63/000/005/0040/0044 ⁵⁶

AUTHOR: Bokshteyn, S. Z.; Kishkin, S. T.; Nikishov, A. S.; Polyak, E. V.;
Solov'yeva, G. G.

TITLE: Aging of plastically deformed alloys (A)

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1963, 40-44

TOPIC TAGS: thermomechanical treatment, high temperature, low temperature, heat resistant steel, heat resistant alloy, titanium alloy, aging, mechanical properties, rupture life

ABSTRACT: A review of published reports on thermomechanical treatment of steels and alloys (TMT) indicates that TMT has a beneficial effect on rupture strength only up to a certain temperature. At higher temperatures the diffusion processes which cause softening proceed at a considerably higher rate than in conventionally treated alloys. For instance, an Ni-Cr-W-Mo-Ti-Al alloy [unidentified] after TMT and aging had a rupture life at 850C 30 to 40% lower than conventionally treated alloys, although its tensile strength was 25% higher. At lower service temperatures (550C for Ni-base alloys and 450 to 500C for Ti-base alloys) TMT greatly increases creep strength and rupture life, especially when combined with aging.

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ACCESSION NR: AP3000488

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The optimum combination of tensile strength, notch toughness, and rupture life for the KhNGGTyur alloy [Nimonic 80A] is obtained by plastic deformation at 1000 to 1050C with a reduction of ~ 30% followed by aging. The VTZ-1 Ti-base alloy, forged at 920C, water quenched, and aged at 550C for 2 hr, had a tensile strength at room temperature of 145.5 kg/mm², elongation of 9.4%, reduction of area of 47%, a notch toughness of 2.0 mkg/cm², and a rupture life (at 450C under 52 kg/mm² stress) of over 150 hr; corresponding figures for a conventionally treated alloy were 117.0 kg/mm², 12%, 34%, 2.9 mkg/cm², and 108 hr. Still greater effects can be achieved by two-stage TMT: deformation at 1200C followed by water quenching; reheating to 1000C and a second deformation with a reduction of 5 to 10%, followed by water quenching and aging. After such treatment the alloy had a rupture life of 200 hr at 550C under a stress of 92 kg/mm² and 100 hr at 650C under a stress of 52 kg/mm²; corresponding figures for conventionally treated alloys were 3 to 7 hr and 60 hr. Combined treatment of the lKh12N2VMF steel (forging with 60% reduction at 1010C, water quenching, sizing at 600C with 5 to 10% reduction, combined with aging for 2 hr) increased the tensile strength at 20C by 40% and at 450C by 60%, and the rupture life (at 450C under a stress of 75 kg/mm²) by 250%. Orig. art. has: 4 figures and 3 tables.

ASSOCIATION: none

Card

2/32

I 30784-001 ENT(m)/ENR(6)/T/ENT(1)/T TLP.01 SD/SS/G0-2

ACC NR: AT6012373

SOURCE CODE: UR/0000/65/000/000/0082/0088

AUTHORS: Kishkin, S. T.; Polyak, E. V.; Solonina, O. P.; Moiseyev, V. N.; Tarasenko, G. N.; Kurayeva, V. P.

ORG: none

TITLE: Structural transformations in titanium alloys

SOURCE: Soveshchaniye po metallokhimii, metallovedeniyu i primeneniyu titana i yego splavov, 6th. Novyye issledovaniya titanovykh splavov (New research on titanium alloys); trudy soveshchaniya, Moscow, Izd-vo Nauka, 1965, 82-88

TOPIC TAGS: annealing, phase composition, alloy, titanium, titanium alloy, electron microscopy/ VT3-1 alloy, VT14 alloy, VT16 alloy, VT15 alloy, VT10 alloy

ABSTRACT: The structural transformations induced by annealing in ($\alpha + \beta$) alloys of the types VT3-1, VT14, and VT16, in β alloy of VT15 and in α alloy of VT10, containing an intermetalloidal strengthening agent, were studied. The study was carried out by means of electron microscopy. Electron microscope photographs of specimens annealed at different temperatures are presented. Annealing alloys under different conditions leads to a phase transformation in the alloys. The optimum phase composition that possesses maximum strength and plasticity was found to consist of single α -phase regions and highly dispersed heterogeneous ($\alpha + \beta$) phase regions resulting from the decomposition of the metastable β -phase. Thermal stability of alloys may be increased by the addition of aluminum to the alloy. Orig. art. has: 2 figures.

Card 1/1 TLP SUB CODE: 11/ SUBM DATE: 02Dec65

I 9557-66 EWT(m)/EWA(d)/EWP(i)/EWP(k)/EWP(z)/EWP(b)/EWA(c) MJW/JD/HW
ACC NR: AP5026362 SOURCE CODE: UR/0370/65/000/005/0143/0148

AUTHOR: ^{44,55}Braslavskiy, D. I. (Moscow); ^{44,55}Kishkin, S. T. (Moscow); ^{44,55}Polyak, R. V. (Moscow);
^{44,55}Roshchina, I. N. (Moscow); ^{44,55}Solov'yeva, G. G. (Moscow); ^{44,55}Cherkis, Yu. Yu. (Moscow)

ORG: none

TITLE: Thermomechanical treatment of heat-resistant martensitic steel

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1965, 143-148

TOPIC TAGS: steel, heat resistant steel, martensitic steel, mechanical heat treatment,
plastic deformation, yield stress, tensile stress /EI961 steel

ABSTRACT: Heat-resistant EI961^A steel (0.14% carbon, 10.8% chromium, 1.75% nickel, 1.65% tungsten, and 0.26% vanadium) has been tested for the effect of thermomechanical treatment (TMT). Three variants of TMT were used: 1) high-temperature thermomechanical treatment (HTMT) — plastic deformation at 900—1050C followed by cooling; 2) low-temperature thermomechanical treatment (LTMT) — austenitizing at 100C, cooling to 600C, plastic deformation, and cooling; and 3) combined high- and low-temperature treatment (HLTMT) — plastic deformation at 1050C, cooling, tempering at 580C for 3 hr, plastic deformation at 600C, and cooling. Preliminary experiments showed that optimum reductions for HTMT or LTMT are 20—30% and for HLTMT, 50% at 1050C and 7—10% at 600C. All three variants of TMT considerably improved strength and heat resistance without a significant decrease in ductility. The room-temperature tensile and yield

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UDC: 669.14-157.9

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ACC NR: AP5026362

strengths of steel subjected to HTMT, LTMT, and HLTMT increased to 117 and 106 kg/mm², 132 and 114 kg/mm², and 133 and 118 kg/mm², respectively (compared to 108 and 92 kg/mm² for conventionally treated steel). Corresponding figures for rupture life at 500C under a stress of 58 kg/mm² were 270, 206, and 222hr (compared to 149 hr for conventionally treated steel). The strengthening effect of HTMT was not annihilated by aging for 100 hr at temperatures up to 550C; that of LTMT was annihilated for the most part by aging at 500C (see Fig. 1). When applied under optimum conditions to ac-

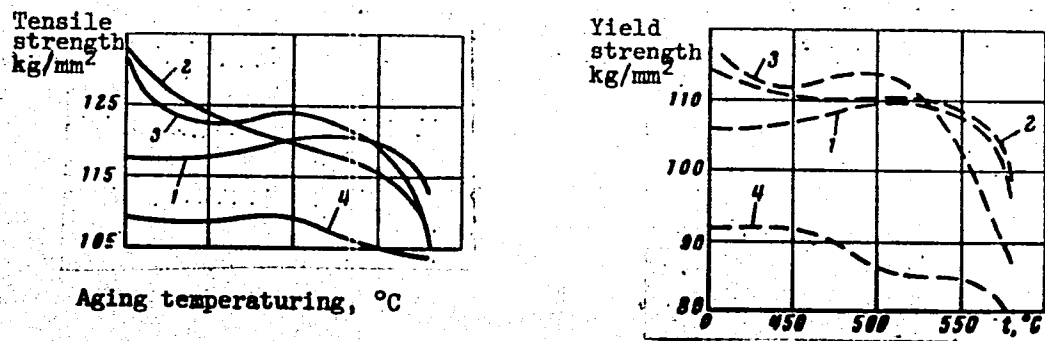


Fig. 1. Effect of 100-hr aging at various temperatures on the tensile and yield strengths of EI961 steel subjected to HTMT (1), LTMT (2), HLTMT (3), and conventional treatment (4)

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L 9557-66

ACC NR: AP5026362

0

tual parts, with the plastic deformation done by die forging, HTMT and HLTMT increased the 100-hr rupture strength at 500C to 62 and 63 kg/mm² (from 57 kg/mm² for conventionally treated steel) and the fatigue strength at 500C, to 46 and 53 kg/mm² (from 35 kg/mm² for conventionally treated steel), respectively. HTMT can be used for parts operating at temperatures up to 550C and HLTMT, for parts operating at temperatures up to 500C. LTMT is not recommended for parts operating at elevated temperatures. Orig. art. has: 2 figures and 3 tables. [DV]

SUB CODE: 11, 20/ SUBM DATE: 06May65/ ORIG REF: 002/ ATD PRESS: 4150

del
Card 3/3

L-53364-65 EWT(m)/EWP(w)/EWA(d)/T/EWP(t)/ENP(k)/EWP(z)/EWP(b)/EWA(c) Pf-4

EWJ/JD/H

ACCESSION NR: AP5013159

UR/0129/65/000/005/0045/0048
669.295:620.18:539.37:621.78

AUTHOR: Glazunov, S. G.; Khorev, A. I.; Polyak, E. V.

TITLE: Thermomechanical treatment of VT15 alloy

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 5, 1965, 45-48,
and insert facing p. 40

TOPIC TAGS: ausforming, thermomechanical treatment, metal mechanical property,
metal deformation, titanium alloy

ABSTRACT: Attempts were made to increase the ductility of CT15*, while retaining its high strength. The area of primary interest was the thermomechanical history of the alloy, above and beyond ordinary quenching and aging. Among the treatments used was a combination of hot deformation (85%) in the single phase β -region at 1050°C and quenching in water with aging at 480°C for 25 hrs, and subsequent re-aging at 560°C for 15 min. This was combined with various annealing and aging treatments, all designed for maximizing strength and ductility. Metallographic studies using optical and electron microscopy indicate how dispersed α -phase precipitation affects aging and mechanical properties of VT15. In all cases the

*(probably VT15)

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L 58364-65
ACCESSION NR: AP5013159

microstructures show α -phase needles dispersed in a β -matrix. However, the length of the needles is noticeably different for each of the treatments. A systematized table summarizes the principal results. Ausforming based on hot working at 1050°C with quenching and subsequent aging at 480 and 560°C is the best treatment for improving mechanical properties. Cold working of the β -phase solution after some hot work results in an increased dispersion of precipitate upon aging.
Orig. art. has: 3 figures, 2 tables

ASSOCIATION: none

SUBMITTED: 00

ENCL: 00

SUB CODE: MM

NO REF SOV: 000

OTHER: 000

RR
Card 2/2

AUTHOR: Polyak, G.

2-58-6-5/16

TITLE: On the Problem of Calculating the Balance of Monetary Receipts and Expenditures (K voprosu ob ischislenii balansa denezhnykh dokhodov i raskhodov naseleniya)

PERIODICAL: Vestnik statistiki, 1958, Nr 6, pp 38-49 (USSR)

ABSTRACT: The balance of monetary receipts and expenditures of the population in the USSR forms one of the statements of the balance of national economy. Such a balance characterizes the national gains from various sources which are at the population's disposal in the form of money. It indicates how the money is spent for acquiring material wealth or deposited in banks. Monetary balances of receipts and expenditures are elaborated for the period under review and for a planned period as well. The former is used for computing the volume, structure and rate of growth of the population's actual income, while the planned balance of monetary receipts and expenditures is in the first place established for ascertaining the population's demand for goods and public utilities and, in connection herewith, for calculating the circulation of retail goods and money. Based on such balances, the purchasing power of the population is determined concerning goods sold in state and cooperative

Card 1/2

2-58-6-5/16

On the Problem of Calculating the Balance of Monetary Receipts and Expenditures

trades and in the markets of kolkhozes.
There is 1 sample balance form.

Card 2/2

30(5)

SOV/2-59-5-5/10

AUTHOR: Polyak, G.

TITLE: The Relation Between the National Income and the State Budget of the USSR

PERIODICAL: Vestnik statistiki, 1959, Nr 5, pp 56-62 (USSR)

ABSTRACT: The editorial introduction states that this article is published in reply to the question asked by S.Ye. Orlovskiy (Leningrad). The author then describes the gross National Income as the total value of all material produced annually within the country. From the gross income, the net national income is obtained by subtracting the value of material consumed in the course of production. All the materials produced within the USSR are divided into productive or non-productive, according to whether they are used to further increase production or are consumed without reproduction. The process of distribution, which follows production, involves transfer of money from one part of the population and institutions to

Card 1/2

The Relation Between the National Income and the State Budget
of the USSR

SOV/2-59-5-5/10

another. The state collects money (in taxes, etc.) and distributes them in payment for productive and non-productive services and transactions. The budgetary revenue of 1957 of the USSR constituted about 51% of the national income, therefore, the state appears as the greatest individual user of the national income. Although part of this revenue is used later for non-productive purposes, the function of the Socialist State goes far beyond a mere administration or redistribution of the funds created by the nation. The state takes an active part in the control of the national production and to a great extent is a producer of this income as well as its user.

Card 2/2

EL'KIN, Josif Lazarevich; POLYAK, Grigoriy Abramovich; BURLINCA,
F.I., red.

[The KM-9D unit] Kompleks KM-9D. Donetsk, Donetskoe knizhnoe
izd-vo, 1963. 33 p. (MIRA 18:3)

SOSNOVSKIY, L.B.; EL'KIN, I.L.; POLYAK, G.A.

Results of the experimental operation of the KM-9D complex.
Ugol' Ukr. 6 no.6:35-36 Je '62. (MIRA 15:7)

1. Trost Snezhnyanantsit (for Sosnovskiy). 2. Gosudarstvennyy
proyektno-konstruktorskiy i eksperimental'nyy institut ugol'nogo
mashinostroyeniya (for El'kin, Polyak).
(Coal mining machinery—Testing)

POLYAK, Grigoriy Borisovich; KAPUSTINA, V.S., red.; SMIRNOVA, M.N.,
tekhn.red.

[Teaching of arithmetic in the grammar school; methods
manual for teachers] Prepodavanie arifmetiki v nachal'noi
shkole; metodicheskoe posobie dlia uchitelei. Moskva, Gos.
uchebno-pedagog.izd-vo M-va prosv.RSFSR, 1959. 351 p.
(MIRA 13:2)

(Arithmetic--Study and teaching)

POLYAK, G.B.

IGNAT'YEVA, Matrena Aleksandrovna; POLYAK, G.B., red.; RODIONOVA, Z.A., red.;
KREYS, I.G., tekhn. red.

[Developing independent solution of problems in the first grade]
Privitie navykov samostoiatel'nogo reshenia zadach v I klasse.
Pod red. G.B. Poliak. Moskva, Gos. uchebno-pedagog. izd-vo M-va
prosv. RSFSR, 1957. 69 p. (MIRA 11:7)
(Arithmetic—Study and teaching)

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5965

MEHTIN, M. K., POLYAK, G.B. AND VOLODINA, L.M. Sbornik Arifmeticheskikh

Zadach and uprazhneniy. Dlya Tret'ego Klassa nach. Shkoly. per. 1. Amchba.
k. Lomia. 2-Ye izd. Shkhumi, Abgiz, 1954. 197 s. s ill. vos.,. 2.000 ekz.
95k.-Na Ankhaz Yaz- (55-600) 511(o76)

S0: Knizhanya Letopis', vol. 1, 1955

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5966 NIKITIN, N. N., PLYAK, G.B. AND VOLODINA, L.V. Sbornik Arifmeticheskikh Zadach and uprazhneniy. Dlya Tretyego i chetvero klyassov. 1. Arifmetika, N. Leningrad. 2-Ye izd. Sukhumi. Angiz, 1954. 197s. s ill. 20sm. 2.000 kuz. 95K.-Na Abkhaz Yaz.-(55-600) 511(o76)

SO: Knizhnyaya Letopis's, vol. 1, 1955.

POLYAK, G. B.

5969. POHELKO, A. S. I. POLYAK, G. B. - Arifmetika. uchbnik olya vtorogo
klassa nach. shkoly. per. N. T. Vasyanka. izd. 2-ye. Cheboksary,
chuvashgosizdat, 1955. 136s. s ill 23sm. (akad. ped. nauk RSFSR).
15.000 ekz. 1 R. 5 K. V per.- Na chuvash. yaz. (54058253) 511(076)

SO: Knizhnaya Letopis', Vol. 1, 1955

POLYAK, G.B.

5968

POKHLEKIN A. S. AND POLYAK, G. B. , *Metodika. Ucheb-nik Dlya vtorogo*
Klassa nach. shkoly. Mal'shik. Kn. 1955 1960s. s ill. 32sm.
(Akad. Ped. Nauk RSFSR). 3.500 Ekz. 1r. 10k. V per.- Kn Pereplete avt.
Ne ukazany. - na khabard. Yas. (54- 57219) 511(076)

SO: Knizhnyy Letopis', vol. 1, 1955

POLYAK, G. B.

4900. POLYAK, G. B. L. sbornik arifmeticheskikh zadach i uprazheniy. dlya pervogo klassa nach. shkoly. izd. 3-ye, s 10-go (rus.) makhachkala, daguchjedgiz, 1955. 148 s. s ill. 21sm. 10.000 ekz. 1r. 20k. v per. - na avar. yaz.-- (54-56030) 511(076)

SO: Knizhnaya Letopis', Vol. 1, 1955

POLAK, G. B.

4901-02. NIKITIN, N. N., POLYAK, G. B. i VOLODINA, L. N. Sbornik arifmeticheskikh zadach i uprazhneniy. 9-ye IZD., s 10-go rus. Alma-Ata, Kazuchpedgiz, 1955. 21sm. 7 per.--na pereplete avt. ne ukazany.--na kazakh. yaz. 511(076)
Dlya 3-go klassa nach. shkoly. 176 s. s ill 51.000 EKZ. 1r. 25k.--(54-58256)
Dlya 4-go klassa nach. shkoly. 156 s. s Ill. 35.000 EKZ. 1r. 25k.--(54-58320)

SO: Knizhnaya Letopis', Vol. 1, 1955

POLYAK, G. B.

4903. NIKITIN, N. N., POLYAK, G. B. i VOLODINA, L. N. Sbornik arismeticheskikh zadach i uprazhneniy. Dlya 4-go klassa nach. Shkoly. 4-ye IZD., s 10-go rus. nukus-samarkand, karakalpakgiz, 1955. 155 s. s ill. 21sm. 3.000 EKZ. 1r. 55k. V per.--na karakalpak. yaz.--(54-57829) 511(076)

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N.I., redaktor; MAKHOVA, N.N., ~~tekhnicheskii~~ redaktor

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158 p. (MIRA 8:7)

(Arithmetic--Study and teaching)

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V.S., redaktor; TSIRUL'VITSKIY, N., ~~tekhnicheskii~~ redaktor

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uchebnik dlia 2-go klassa nachal'noi shkoly. Izd. 2-e. Moskva, Gos.
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(Arithmetic)

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Modeling of Beams. Rev. NIIPI no. 14913-317 1971. (MIRA 72:9)

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(Hydroelectric power stations)
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DIZHUR, D.P.; POLYAK, G.I.; SALITA, P.Z.

Principal features of the joint operation of the Volgograd-
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'61. (MIRA 15:7)

(Electric power distribution)
(Interconnected electric utility systems)

RUSSIAN
KOSTENKO, M.P., akademik; ZAVALISHIN, D.A., prof.; SHCHEDRIN, N.N., doktor
tekhn. nauk; SALITA, P.Z., inzh.; VAZHNOV, A.I., kand. tekhn. nauk,
dots.; ROZOVSKIY, Yu.A., kand. tekhn. nauk; MARCHENKO, Ye.A., kand.
tekhn. nauk.; POLYAK, G.I., inzh.; VENIKOV, V.A., doktor tekhn. nauk, prof.

Dynamic models of power systems. Elektrichestvo no.2:78-85 F '58.

(MIRA 11:2)

1. Nauchno-issledovatel'skiy institut postoyannogo toka (for Schedrin,
Salita, Vashnov, Rozovskiy, Marchenko, Polyak). 2. Chlen-korrespondent
AN Uzbekskoy SSR (for Shchedrin). 3. Moskovskiy energeticheskiy
institut (for Venikov).

(Electric networks)

BELOUSOV, V.R.; LEBEDEV, L.N.; POLYAK, G.I.

Simulation of turbines and their speed regulators. Izv. NIPT
no.5:273-284 '60. (MIRA 14:1)
(Turbines--Electromechanical analogies)

KAZACHKOV, A.I., inzh. (Leningrad); KLIMOV, V.A., inzh. (Leningrad); POLYAK,
G.I., inzh. (Leningrad)

Use of a calculating board in computing power systems with d.c.
current transmission. Elektrichestvo no.9:11-14 S '60.

(MIRA 13:10)

(Electric power distribution)

AUTHOR: Polyak, G.I. Engineer (Leningrad) 105-58-6-3/33

TITLE: Automatically Controlled Series Excitation of Generators
(Avtoreguliruyemoye seriyesnoye vozbuzhdeniye generatorov)

PERIODICAL: Elektrichestvo, 1958, Nr 6, pp. 10 - 15 (USSR)

ABSTRACT: In this paper the characteristics and advantages of a series excitation in the case of voltage control are shown. First of all a direct-current motor with direct control is investigated as to voltage deviation. Then the wiring diagram of the automatically controllable series excitation is represented. A series generator is being connected with the exciting circuit. The question of stability of the automatically controllable series excitation is settled by means of the characteristic equation (5) of the system of equations (4). The control will be stable if the factors of (5) are positive. This is possible when the conditions (6) are fulfilled. The analysis of (6) shows that the control stability even in the case of so high values of the negative "statism" is guaranteed, which are of no practical importance. The automatically controllable series excitation

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Automatically Controlled . . Series Excitation of Generators

of a synchronous machine is investigated by means of an example (reference 6 on page 310 was used), for the case of a normal inertialess control. In order to be able to evaluate the effectiveness of an automatically controllable series excitation the change of an aperiodical exciting current component was investigated in the case of generator short circuits. The electromotive force in the longitudinal circuit is determined by means of the equations (7). The models represented here were tested in the laboratory on direct and alternating current generators. The wiring diagram of the automatically controllable series excitation was tested on the model of the turbogenerator of the electrodynamical model of NII (scientific research institute) for direct current in the case of connecting an asynchronous motor with comparable output. The received oscillograms give evidence of the stability and effectiveness of the regulation system represented here, in the cases of positive as well as negative statism. From the oscillogram we learn that the exciting current "watches" the stator current, and it can be kept equal to the initial value of the aperiodical

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Automatically-Controlled Series Excitation of Generators

component or higher. Based upon the models, the conclusion can be drawn that the automatically controllable series excitation of the synchronous machines is a fairly simple system of an automatical excitation regulation, and that it guarantees a much higher static and dynamic stability then it is the case when automatical regulators are used, which act upon the shunt or an **separate** excitation. There are 7 figures, 1 table, and 7 references, 5 of which are Soviet.

SUBMITTED: May 6, 1957

1. Generators--Control systems 2. Control systems--Performance

Card 3/3

POLYAK, G.I., inzh. (Leningrad); GOLYATIN, V.G. (Leningrad)

Circuit diagram for testing powerful high-voltage valves.

Elektrichestvo no.3:73-74 Mr '60.

(MIRA 13:6)

(Electric current rectifiers--Testing)

POLYAK, G.I., inzh. (Leningrad)

Automatically controlled series excitation of generators.

Elektrichestvo no.6:10-15 Je '58.

(MIRA 11:6)

(Electric generators) (Voltage regulators)

POLYAK, G.I.

Utilizing transmission of direct current to raise the stability of
the contiguous transmission of alternating current. Izv. NIPT no.4:
65-75 '59. (MIRA 13:2)
(Electric power distribution)

8(3)

AUTHORS:

Polyak, G. I., Engineer,
Golyatin, V. G., Engineer (Leningrad)

S/105/60/000/03/014/023
B007/B008

TITLE:

Circuit Scheme for Testing Large High-voltage Valves²⁵

PERIODICAL:

Elektrichestvo, 1960, Nr 3, pp 73-74 (USSR)

ABSTRACT:

It is shown here on the basis of the artificial circuit diagram (Fig 1) proposed by V. G. Golyatin (Ref, Footnote p 73, Author's Certificate Nr 103424 of June 6, 1949) for the investigation of large valves that the working conditions for valves in a transformer installation differ considerably from those in an artificial circuit diagram of similar type. An improved circuit diagram (Fig 2) is given here. In contrast with the "artificial" circuit diagrams, a voltage is applied in this circuit diagram which develops in a natural way in a high-voltage transformer circuit diagram. The installation is composed of 3 circuits: the high-voltage circuit, the current circuit, and the oscillation circuit. The valve to be investigated is connected to 2 circuits, the high-voltage and the current circuit. A special separating valve serves for separating these 2 circuits (in the application of the voltage of the high-voltage circuit

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Circuit Scheme for Testing Large High-voltage
Valves

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to the valve). In order to fulfill its task, the electric strength of this valve must be fully restored at the moment of the extinction of the valve to be investigated. This, however, is only possible if the separating valve extinguishes sooner by the same amount of time needed for the restoration of its electric strength. If only 2 circuits, the current circuit and the high-voltage circuit are available, the circuit diagram given here is similar to that proposed by I. D. Shkolin (Ref, Footnote p 73, Author's Certificate Nr 34072 of October 22, 1932) for the investigation of six-phase valves. The circuit diagram with 2 circuits in this form is unsuitable for the investigation of large high-voltage valves. In supplementing the 2 circuits by an oscillation circuit it becomes possible to reproduce the working conditions of the valve not only with regard to the voltage, but also with regard to the current. The mode of operation of the circuit diagram under normal conditions with all 3 circuits is shown here. Oscillographs are given in figures 3, 4, and 5 for the illustration of the mode of operation. The circuit diagram proposed here allows to investigate the valves not only under normal conditions,

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Valves

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but also under emergency conditions. A suitable grid sweep must be provided in this case. It must be carried out in such a way that the emergency condition in the high-voltage circuit automatically creates an artificial emergency condition in the current circuit. There are 5 figures and 2 Soviet references.

SUBMITTED: July 14, 1958

Card 3/3

AUTHORS:

P. V. A. G.
~~Polysak, G. I.~~, Engineer. Salita,
P. Z., Engineer

105-58-5-3/28

TITLE:

On Utilizing D. C. Transmission for Improving
Stability (K voprosu ob ispol'zovanii peredachi
postoyannogo toka dlya povysheniya ustoychivosti)

PERIODICAL:

Elektrichestvo, 1958, Nr 5, pp. 12-14 (USSR)

ABSTRACT:

The investigations being carried out at the Institute for Direct Current already now permit to mention some properties which essentially improve the competitiveness of d. c. transmissions. To them belong above all the possibility to employ the d. c. transmission for the purpose of improving the dynamic and static stability and to attenuate the phase swinging. The investigations were performed on the electrodynamic model of the institute with respect to an application in the Stalingrad hydroelectric plant and the transmission from the Stalingrad hydroelectric plant to Moscow (a. c.) and Stalingrad hydroelectric plant - Donbass (d. c.). The comparison of the obtained oscillograms shows that the

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On Utilizing D. C. Transmission for Improving Stability 105-58-5-3/28

short-term 40 % forcing and the compound connection (compounding) of the d. c. transmission against the slippage render it possible to rise according to the dynamic strength the limit up to the level of static strength. Thanks to the compound connection the dynamic transition approaches the aperiodic one. The attenuation of the phase swinging is obtained by means of very small load variations of the d. c. transmission. Similar results with respect to attenuating the oscillation were obtained in switching on and off sections in the 500 kV line, in loading and discharge etc. It was found that the static stability can be improved by means of an influence upon the d. c. transmission. A pairing of strong excitation control with strong control of the braking moment as the first tests already showed, may have very advantageous effects. Furthermore it was determined that for the purpose of employing d. c. transmission for an improvement of the static and dynamic stability of the adjoining a. c. transmission neither in this nor in that scheme modifications are necessary. However, the division of the 500 and 200 kV lines or the switching off the d. c.

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transmission must be accompanied by a reduction of load on the a. c. circuit. Summarizingly, it can be said that the d. c. transmission from the Stalingrad hydroelectric plant to Donbass can essentially influence the improvement of static and dynamic stability of a. c. transmission from the Stalingrad hydroelectric plant to Moscow. There are 4 figures.

ASSOCIATION: Nauchno-issledovatel'skiy institut postoyannogo toka
(Scientific Research Institute for Direct Current)

SUBMITTED: December 27, 1957

AVAILABLE: Library of Congress

1. Power plants--Model test results 2. Electrical networks--Design
3. Electric current--Transmission--Test results 4. Alternating
current--Transmission--Stability 5. Direct current--Transmission--
Properties

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POLYAK, G.I.

ARTEM'YEV, D.Ye., inzhener; MARCHENKO, Ye.A., inzhener; POLYAK, G.I., inzhener.

Equipment for linear capacitive compensation in 110 and 220 kv. networks.
Elektrichestvo no.8:33-40 Ag '56. (MLRA 9:10)

1. Nauchno-issledovatel'skiy institut postoyannogo toka.
(Electric power distribution)